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APRIL 21, 1986
CHEMICAL & ENGINEERING
NEWS

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C&EN's Top 50 Chemical Products

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News of the Week

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Top 50 Chemicals Production Dropped Moderately in 1985

Inorganic chemicals output fell most sharply in overall decline; biggest single decrease last year was registered by methanol

David Webber, C&EN New York

Chiefly because of the continuing slump in the U.S. farm economy, production of many major inorganic chemicals declined sharply in 1985 from the year before. As a result, output of basic chemicals, as indicated by C&EN's Top 50 chemicals group, fell 2.6% last year from the 1984 level. The drop ended a string of two consecutive years during which Top 50 chemicals production had increased from the previous year.

The year was a poor one for inorganic chemicals nearly across the board. With substantial decreases in production of major fertilizer chemicals, including phosphoric acid, urea, and potash, as well as of other big-volume inorganics like chlorine and sodium hydroxide, composite output of the inorganic chemicals on the Top 50 list declined 3.9% last year from 1984. Over the past five years, inorganics production has fallen at an average annual rate of 1.6%.

Nor was 1985 a banner year for the organic chemicals component of the Top 50. Production of those substances was essentially level, registering a scant 0.1% increase over 1984's composite total. That reflection of mediocre demand left the 1985 output total just below its level in 1980, when organics production amounted to 176 million lb.

Last year's decline was widespread, with 31 of the Top 50 chemicals registering a decrease from 1984 production. By contrast, output of all but six members of the group rose in 1984 from 1983 levels. Production in 1984 was the highest since 1980, a good year in which total output was just 1.4% below the

About the Top 50 list of chemical products

Government data, trade association figures, and industry estimates all go into preparing C&EN's annual list of the Top 50 chemical products, ranked by production volume. The federal government is relied upon most heavily, but when government figures are not available, other sources, primarily trade associations, are used. Industry sources and C&EN estimates are used only when other data are lacking.

Government data are not always accurate—they are only as good as the information that individual companies report. But they are an objective measure of production extending back for many years. Therefore, relatively accurate indications of growth can be made on a consistent basis.

At this time of year, C&EN has access only to preliminary reports of production for 1985. When the government and trade associations issue their final reports, the outcome can be changed, sometimes dramatically. As a result, production figures for earlier years that appear in the table on page 13 are different in some cases from those published in last year's Top 50 report. The final reports also can affect the rankings of chemicals. The 1984 rankings of 26 of the chemicals listed in the table, for example, are different from those in the similar table published by C&EN a year ago (C&EN, May 6, 1985, page 11).

The list itself covers production figures for the U.S. and includes chemicals produced for export. Candidates for the list include all basic, intermediate, and chemically homogeneous finished products. These range from chemical building blocks like ethylene and propylene to downstream products like vinyl acetate and ethylene glycol.

The roster also includes basic inorganic chemicals, but does not include what C&EN considers to be minerals, such as salt, gypsum, and sulfur. Lime is included because it is processed and has many chemical and industrial applications. Refractory (dead-burned) dolomite is excluded in the calculation of lime production.

In the organics list, such petrochemical feedstocks as ethane, butane, and propane are excluded arbitrarily, because they are considered to be products of oil companies and because they have many nonchemical uses.

There are other gray areas besides lime and petrochemical feedstocks. For example, the basic aromatics—benzene, toluene, and xylene—are included. Admittedly, this makes the list less pure chemically.

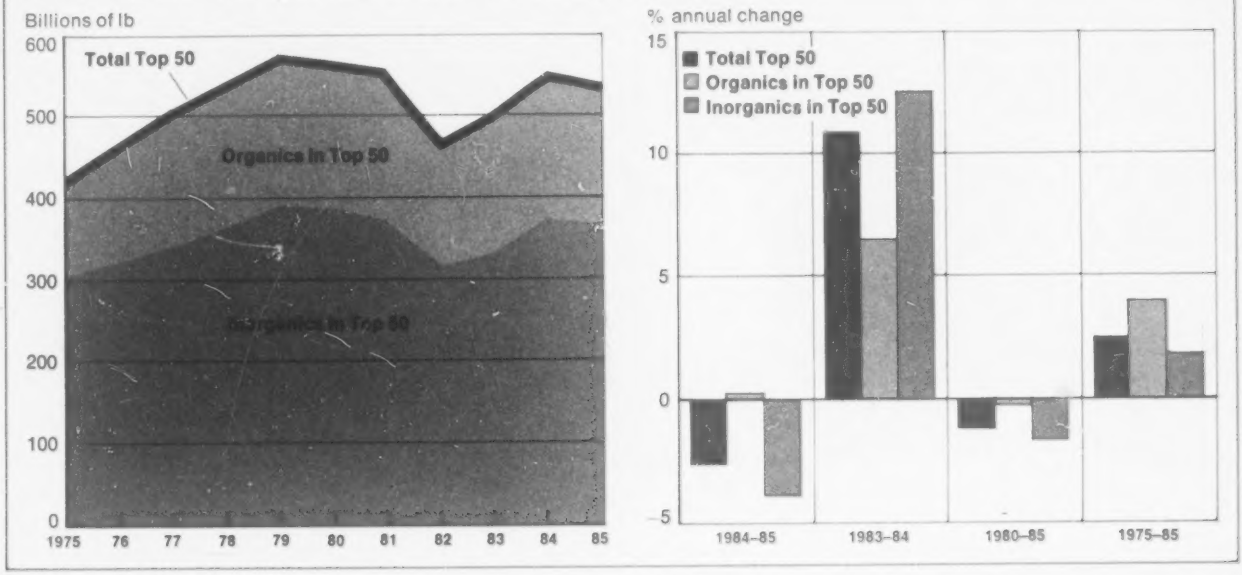
Production figures are published by the government and trade associations in a variety of units—millions of pounds, thousands of tons, billions of cubic feet, millions of gallons, metric tons. To provide an accurate ranking and to make comparison of production volumes easier, C&EN not only gives production in common units but converts production to billions of pounds as well.

Top 50 chemicals output declined 3% last year

Rank			Billions of lb		Common units[b]		Average annual growth			
1985	1984[a]		1985	1984	1985	1984	1984–85	1983–84	1980–85	1975–85
1	1	Sulfuric acid	79.23	83.60	39,615 tt	41,802 tt	−5.2%	11.6%	−2.1%	2.0%
2	2	Nitrogen	46.88	47.90	647 bcf	661 bcf	−2.1	18.0	6.2	9.8
3	3	Ammonia	32.40	33.38	16,201 tt	16,692 tt	−2.9	19.6	−3.8	−0.1
4	4	Lime[c]	31.60	31.98	15,800 tt	15,992 tt	−1.2	7.6	−3.6	−1.4
5	5	Oxygen	31.37	31.87	379 bcf	385 bcf	−1.6	11.3	−2.5	0.7
6	6	Ethylene	30.55	31.38	30,550 mp	31,383 mp	−2.7	9.4	1.3	4.1
7	7	Phosphoric acid	20.98	22.74	10,492 tt	11,370 tt	−7.7	16.4	−0.7	3.2
8	8	Sodium hydroxide	20.35	21.83	10,175 tt	10,914 tt	−6.8	6.7	−2.6	0.5
9	9	Chlorine	19.09	21.40	9,545 tt	10,699 tt	−10.8	7.4	−3.5	0.4
10	10	Sodium carbonate[d]	17.10	17.02	8,551 tt	8,511 tt	0.5	0.5	0.7	7.0
11	12	Nitric acid	15.56	15.45	7,778 tt	7,726 tt	0.7	10.9	−3.4	0.3
12	11	Propylene	14.93	15.56	14,930 mp	15,559 mp	−4.0	11.5	1.8	5.5
13	14	Ammonium nitrate[e]	13.81	14.29	6,906 tt	7,146 tt	−3.4	14.5	−5.4	−0.3
14	15	Ethylene dichloride	13.63	10.71	13,632 mp	10,710 mp	27.3	−6.9	4.2	5.5
15	13	Urea[f]	13.11	14.87	6,556 tt	7,433 tt	−11.8	23.6	−3.5	6.3
16	16	Benzene	9.73	9.71	1,321 mg	1,318 mg	0.2	6.9	−8.0	2.6
17	17	Carbon dioxide[g]	8.63	9.13	4,315 tt	4,565 tt	−5.5	16.5	7.5	8.8
18	20	Ethylbenzene	8.55	7.56	8,547 mp	7,562 mp	13.0	−4.0	2.3	5.9
19	22	Vinyl chloride	7.78	6.09	7,775 mp	6,085 mp	27.8	−11.5	3.8	6.4
20	19	Styrene	7.45	7.71	7,454 mp	7,709 mp	−3.3	13.3	1.7	4.8
21	23	Terephthalic acid[h]	7.17	5.91	7,165 mp	5,912 mp	21.2	5.1	3.4	4.5
22	18	Methanol	5.98	8.19	5,979 mp	8,186 mp	−27.0	2.6	−3.5	1.5
23	25	Ethylene oxide	5.83	5.70	5,833 mp	5,699 mp	2.4	3.0	2.2	2.7
24	24	Formaldehyde[i]	5.70	5.82	5,699 mp	5,815 mp	−2.0	6.4	0.5	2.3
25	26	Hydrochloric acid	5.56	5.46	2,780 tt	2,732 tt	1.8	12.9	−0.8	3.3
26	21	Xylene	5.25	6.15	729 mg	854 mg	−14.6	17.6	−4.3	1.3
27	27	Toluene[j]	4.99	5.28	688 mg	728 mg	−5.5	−6.7	−7.5	−0.2
28	29	*p*-Xylene	4.72	4.26	4,724 mp	4,264 mp	10.8	3.6	2.2	6.6
29	28	Ethylene glycol	4.68	4.82	4,679 mp	4,823 mp	−3.0	9.0	1.3	2.1
30	30	Ammonium sulfate	4.10	4.13	2,049 tt	2,067 tt	−0.9	5.7	−0.8	−0.3
31	31	Cumene	3.33	3.75	3,328 mp	3,754 mp	−11.3	12.2	−0.8	5.2
32	32	Potash[k]	2.92	3.45	1,325 tmt	1,564 tmt	−15.3	9.4	−10.0	−5.2
33	35	Acetic acid	2.88	2.62	2,875 mp	2,619 mp	9.8	−6.7	−0.7	2.7
34	34	Phenol[l]	2.78	2.89	2,777 mp	2,889 mp	−3.9	9.6	1.6	4.7
35	33	Carbon black	2.57	2.89	2,571 mp	2,893 mp	−11.1	15.9	0.2	−0.7
36	36	Butadiene[m]	2.53	2.45	2,525 mp	2,452 mp	3.0	4.2	−2.0	−0.3
37	44	Sodium sulfate[n]	2.40	1.74	1,199 tt	872 tt	37.5	2.1	1.0	−0.2
38	38	Acrylonitrile	2.35	2.22	2,346 mp	2,219 mp	5.7	3.4	5.1	6.8
39	40	Vinyl acetate	2.11	2.02	2,112 mp	2,024 mp	4.3	3.1	1.9	5.1
40	37	Aluminum sulfate	2.01	2.26	1,003 tt	1,129 tt	−11.2	2.4	−4.8	−1.3
41	43	Propylene oxide	1.88	1.78	1,882 mp	1,779 mp	5.8	−4.5	1.3	2.1
42	42	Acetone	1.80	1.86	1,801 mp	1,862 mp	−3.3	0.2	−2.8	0.9
43	41	Cyclohexane	1.74	1.99	1,743 mp	1,994 mp	−12.6	20.4	−2.4	0.1
44	49	Methyl *tert*-butyl ether[o]	1.69	1.38	1,693 mp	1,376 mp	23.0	64.0	nm	nm
45	45	Titanium dioxide	1.63	1.67	814 tt	835 tt	−2.5	10.3	2.6	3.0
46	39	Calcium chloride[p]	1.60	2.10	800 tt	1,049 tt	−23.7	22.4	−4.0	−3.7
47	46	Sodium silicate	1.47	1.50	736 tt	750 tt	−1.9	3.0	−1.8	0.2
48	48	Adipic acid	1.30	1.39	1,298 mp	1,390 mp	−6.6	8.6	−2.5	−0.3
49	50	Sodium tripolyphosphate	1.21	1.35	607 tt	675 tt	−10.1	0.9	−3.5	−2.4
50	47	Isopropyl alcohol	1.12	1.39	1,118 mp	1,394 mp	−19.8	15.3	−9.4	−3.0
TOTAL ORGANICS			175.55	175.46			0.1%	6.5%	−0.1%	4.0%
TOTAL INORGANICS			362.48	377.16			−3.9%	12.5%	−1.6%	1.8%
GRAND TOTAL			538.03	552.62			−2.6%	10.8%	−1.1%	2.4%

a Revised. b tt = thousands of tons, bcf = billions of cubic feet, mp = millions of pounds, mg = millions of gallons, tmt = thousands of metric tons. c Except refractory dolomite. d Natural and synthetic. e Original solution. f 100% basis. g Liquid and solid only. h Includes both acid and ester without double counting. i 37% by weight. j All grades. k K_2O basis. l Synthetic only. m Rubber grade. n High and low purity. o Production data for earlier years unavailable. p Solid and liquid. nm = not meaningful.

Basic chemical output has decreased 1% a year since 1980



industry's historical high reached in 1979. In 1985, by comparison, composite production was 6.6% below the 1979 peak.

For the entire Top 50 group, composite output dwindled at a 1.1% compound annual rate between 1980 and 1985. Over the past 10 years, on the other hand, Top 50 production grew at an average annual rate of 2.4%. Between 1974 and 1984, Top 50 output grew at an annual rate of just 1.4%. That figure is really a better indicator of the chemical industry's long-term growth rate, however, since 1985's 10-year growth rate is calculated on a base of output in 1975, a deep recession year. A clearer picture of the industry's essential maturity emerges in a calculation of production growth between 1976 and 1985: an average annual rate of just 1.6%.

The greatest individual growth in terms of production last year all came on the side of the organics. The largest increase in 1985 was registered by vinyl chloride, output of which rose 28% to 7.8 billion lb. The gain pushed the chemical up to 19th place on the Top 50 list from 22nd place in 1984. Next, in terms of percentage gains, came ethylene dichloride, up 27% to 13.6 billion lb; methyl *tert*-butyl ether (MTBE), slowing from its 1984 increase of 64%, but still up 23% last year to 1.7 billion lb; terephthalic acid, up 21% to 7.2 billion lb; and ethylbenzene, up 13% to 8.6 billion lb.

On the negative side, the biggest decrease in production last year was recorded by methanol. Output of methanol dropped 27% to 6 billion lb, a decline that demoted the chemical from 18th on the 1984 list to 22nd in 1985. The other products leading the list of production decreases last year were calcium chloride, down 24% to 1.6 billion lb; isopropyl alcohol, down 20% to 1.1 billion lb; potash, down 15% to 2.9 billion lb; and xylene, down 15% to 5.3 billion lb. Output of many other products also fell more than 10% last year, including chlorine, urea, cumene, carbon black, aluminum sulfate, cyclohexane, and sodium tripolyphosphate.

The production decline for calcium chloride is probably overstated in this list because of improvements in government output statistics. Before 1985, the Bureau of Mines, which tracks calcium chloride production, had to estimate output of a major producer that refused to supply any data. Last year, that company for the first time provided what it termed a good approximation of its production. The Bureau of Mines therefore considers its 1985 statistic more or less a "hard number," but now figures that previous years' statistics are probably on the high side. No revision is planned.

Between 1980 and 1985, the overall downward trend was defied by 21 of the chemicals on the Top 50 list. Leading in individual growth over the five-year span were industrial gases. Output of carbon dioxide grew at an annual compound rate of 7.5%, and production of nitrogen rose at an average annual rate of 6.2%. Following on the five-year growth list were acrylonitrile, up an average 5.1% a year; ethylene dichloride, up an average 4.2% a year; and vinyl chloride, up an average 3.8% a year.

Leading the general decline between 1980 and 1985 was potash, down a remarkable 10% a year on a compounded basis. The other products with the greatest individual decreases in production were isopropyl alcohol, down 9.4% a year on average; benzene, down 8% a year on average; toluene, down 7.5% a year on average; and ammonium nitrate, down 5.4% a year on average.

Over the past 10 years, all but 14 chemicals on the Top 50 list have increased in output. Again, the best performers were the industrial gases nitrogen and carbon dioxide. Production of nitrogen grew at an average annual rate of 9.8% over the decade, followed by carbon dioxide, output of which increased at an average annual rate of 8.8% during the period. Production of sodi-

um carbonate grew at an average annual pace of 7%, and output rose 6.8% a year on average for acrylonitrile and 6.6% a year on average for *p*-xylene.

The greatest average annual rate of decline in production over the past 10 years was registered by potash. Output has fallen at a compound rate of 5.2% a year. Other shrinking products were calcium chloride, down 3.7% a year on average; isopropyl alcohol, down 3% a year on average; and sodium tripolyphosphate, down 2.4% a year on average.

The fastest growing chemical in recent years has been MTBE, which has increased rapidly in output as production facilities have come on stream. It is impossible to calculate the gasoline additive's long-term growth rates, however, because output of the chemical was too small five years ago to merit an individual line entry in the International Trade Commission's annual compendium of synthetic organic chemicals production.

As has generally been the case, the group comprising the 10 largest chemical commodities in terms of production remained the same in 1985 as the year before. There was a good deal of rank shifting throughout the rest of the list, however. In all, 30 of the chemicals on the list either moved up or down in ranking.

Besides the rise already noted for vinyl chloride and the fall noted for methanol, other significant changes in rank included xylene, which, with its 15% drop in output, fell to 26th place from 21st in 1984; MTBE, which jumped to 44th place from 49th in 1984; and calcium chloride, which plunged to 46th place from 39th in 1984 (previous years' production, however, may have been overstated, as noted). □

Polymer production set record last year

Despite a sharp drop in synthetic rubber output, overall polymer production continued to rise in 1985. Output of plastics, synthetic fibers, and synthetic rubber, which had notched a record high in 1984, rose to a new peak of 49.5 billion lb last year. The growth, which marked the third consecutive annual increase for the product group, lifted the output total 2.2% above the 1984 record and 6.5% above the earlier peak of 46.5 billion lb reached in 1979.

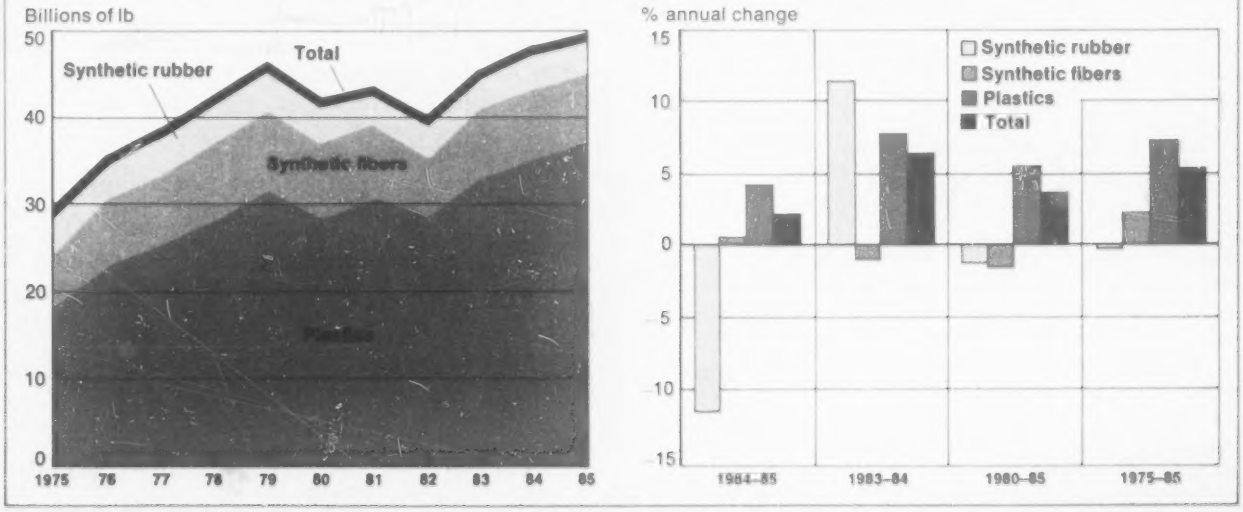
Leading the way was the plastics segment, which grew 4.4% last year and accounted for three quarters of the entire polymers group's production total. The strongest growth was registered by the thermoplastics side of the segment, highlighted by a 9.6% increase in high-density polyethylene output and increases of 5.7% and 5.6%, respectively, for low-density polyethylene and polystyrene. Overall, thermoplastics production rose 5% last year.

By comparison, output of thermosetting resins grew just 1.5% in 1985, despite a strong 4.8% rise in production of phenolic resins. The problem was weak performance by other members of the group: melamine resins, down 8.6%; unmodified epoxy resins, down 5.2%; and unsaturated polyester resins, down 0.7%.

Over the past five years, by contrast, the thermosets led in production growth with an average annual gain of 6.6% compared with 5.3% for the thermoplastics. The chief reason was phenolic resins, output of which grew at a compound rate of 12% between 1980 and 1985. Other notable growth among plastics over the five-year span includes high-density polyethylene, up 8.7% a year on average, and polypropylene, up 7.1% a year on average.

Surveying 10-year production growth, almost all the plastics statistics for 1985 look good when compared with those for 1975, a year of sharp recession for the resins group.

Output was up for plastics, flat for fibers, and down for rubber in 1985



Total polymers production was just under 50 billion lb last year

	Billions of lb		Common units					Average annual growth			
	1985	1984	1985	1984	1983	1980	1975	1984–85	1983–84	1980–85	1975–85
PLASTICS (millions of lb)											
Thermosetting resins	**5.63**	**5.55**	**5,631**	**5,549**	**5,254**	**4,093**	**2,888**	**1.5%**	**5.6%**	**6.6%**	**6.9%**
Phenol, other tar acid resins	2.62	2.50	2,621	2,502	2,484	1,499	1,051	4.8	0.7	11.8	9.6
Urea resins	1.21	1.20	1,210	1,199	1,172	1,165	690	0.9	2.3	0.8	5.8
Polyesters (unsaturated)	1.22	1.23	1,223	1,232	1,084	947	834	−0.7	13.7	5.2	3.9
Epoxies (unmodified)	0.39	0.41	385	406	334	315	198	−5.2	21.6	4.1	6.9
Melamine resins	0.19	0.21	192	210	180	167	115	−8.6	16.7	2.8	5.3
Thermoplastic resins	**31.53**	**30.04**	**31,525**	**30,036**	**27,799**	**24,335**	**15,423**	**5.0%**	**8.0%**	**5.3%**	**7.4%**
Low-density polyethylene	8.89	8.41	8,889	8,413	8,041	7,291	4,743	5.7	4.6	4.0	6.5
PVC and copolymers	6.77	6.76	6,772	6,760	6,066	5,470	3,648	0.2	11.4	4.4	6.4
High-density polyethylene	6.67	6.09	6,671	6,085	5,691	4,405	2,468	9.6	6.9	8.7	10.5
Polystyrene[a]	4.05	3.84	4,054	3,838	3,567	3,521	2,662	5.6	7.6	2.9	4.3
Polypropylene	5.14	4.94	5,139	4,940	4,434	3,648	1,902	4.0	11.4	7.1	10.5
TOTAL[b]	**37.16**	**35.59**	**37,156**	**35,585**	**33,053**	**28,428**	**18,311**	**4.4%**	**7.7%**	**5.5%**	**7.3%**
SYNTHETIC FIBERS (millions of lb)											
Cellulosics	**0.60**	**0.63**	**595**	**629**	**640**	**806**	**749**	**−5.4%**	**−1.7%**	**−5.9%**	**−2.3%**
Rayon	0.39	0.43	390	430	411	490	436	−9.3	4.6	−4.5	−1.1
Acetate[c]	0.21	0.20	205	199	229	316	313	3.0	−13.1	−8.3	−4.1
Noncellulosics[d]	**7.55**	**7.47**	**7,549**	**7,473**	**7,534**	**7,874**	**5,874**	**1.0%**	**−0.8%**	**−0.8%**	**2.5%**
Polyester	3.34	3.39	3,341	3,392	3,543	3,989	2,995	−1.5	−4.3	−3.5	1.1
Nylon[e]	2.34	2.41	2,343	2,412	2,418	2,358	1,857	−2.9	−0.2	−0.1	2.4
Glass fiber	na	1.39	na	1,394	1,167	867	547	na	19.5	na	na
Olefin	1.23	1.00	1,234	998	902	748	497	23.6	10.6	10.5	9.5
Acrylic[f]	0.63	0.67	631	671	671	779	525	−6.0	0.0	−4.1	1.9
TOTAL[b,d]	**8.14**	**8.10**	**8,144**	**8,102**	**8,174**	**8,680**	**6,623**	**0.5%**	**−0.9%**	**−1.3%**	**2.1%**
SYNTHETIC RUBBER (thousands of metric tons)											
Styrene-butadiene[g]	1.78	2.11	805	958	904	1,074	1,179	−16.0%	6.0%	−5.6%	−3.7%
Polybutadiene	0.73	0.79	329	359	333	311	290	−8.4	7.8	1.1	1.3
Ethylene-propylene	0.47	0.47	215	215	175	144	84	0.0	22.9	8.3	9.9
Nitrile	0.12	0.15	55	67	55	63	55	−17.9	21.8	−2.7	0.0
Other[h]	1.11	1.23	503	556	468	423	332	−9.5	18.8	3.5	4.2
TOTAL[b]	**4.20**	**4.75**	**1,907**	**2,155**	**1,935**	**2,015**	**1,940**	**−11.5%**	**11.4%**	**−1.1%**	**−0.2%**

a No longer includes acrylonitrile-butadiene-styrene or styrene-acrylonitrile resins; historical data are restated. b Totals are for those products listed. Totals may not add because of rounding. c Includes diacetate and triacetate yarn; does not include cigarette filters. d All totals and growth statistics restated to exclude glass fiber. e Includes aramid. f Includes modacrylic. g Excludes high-styrene latex. h Beginning with 1985, includes neoprene; historical data are restated. Also includes butyl, polyisoprene, chlorosulfonated polyethylene, polyisobutylene, and acrylo, fluoro, polysulfide, and silicone elastomers. **na** = not available. **Sources:** Society for the Plastics Industry, Textile Economics Bureau, Rubber Manufacturers Association

Between 1975 and 1985, production for the entire plastics segment rose at a compound rate of 7.3%. When compared with postrecession 1976, on the other hand, average annual growth for the entire group through 1985 was a more modest but still strong 5.5%.

Inundated by the tide of imports that has hit much of the textile sector the past few years, the synthetic fibers segment still managed an 0.5% increase in composite production in 1985 compared with the year before. The noncellulosics group, which accounted for more than 90% of fiber production last year, recorded a 1% output increase; cellulosic production fell 5.4%. Actually, production of almost all fibers declined last year. The only reason the composite total rose was because of a 24% increase in output of olefin fibers.

Over the past five years, fibers output has declined at a compound rate of 1.3% a year, mainly because of an average annual 3.5% drop in output of polyester fibers. Polyester fibers accounted for 41% of all synthetic fibers production in 1985.

The overall growth rate and other totals also exclude production of glass fiber, which was not reported for 1985 by the Textile Economics Bureau. Total shipments of glass fiber last year, including both domestic shipments and exports, were 1.26 billion lb, down about 4% from the year before.

A nearly across-the-board negative performance brought synthetic rubber production down 12% in 1985 compared with the previous year. Only ethylene-propylene rubber, output of which was absolutely flat, escaped the minus column. The worst declines were turned in by nitrile rubber, down 18%, and styrene-butadiene rubber, which accounted for more than 40% of all synthetic rubber production, down 16%.

Synthetic rubber continues to be the sick man of the polymers group. Over the past five years, the segment's production has declined at an average annual rate of 1.1%. In the past 10 years, the compound rate of decline has been 0.2%. The chief reason is the steady decrease of styrene-butadiene rubber output, down at a compound rate of 5.6% between 1980 and 1985 and down at a compound rate of 3.7% between 1975 and 1985. □

Canadian Chemical Upturn Continues

Despite some troubling signs on the economic horizon, the Canadian chemical industry is moving into the second quarter of the year with a fair degree of confidence.

The new federal budget will take a bigger tax bite out of corporate earnings. Plunging oil prices will take a heavy toll in some provinces, particularly energy-rich Alberta. A weak Canadian dollar and relatively high interest rates still worry some Canadian economists.

But the general consensus is that, with interest rates starting to ease, the Canadian economy will be able to overcome its other handicaps and chalk up its fourth successive year of recovery following the 1981–82 recession. Growth certainly won't keep pace with the 4.5 to 5% gross national product increases recorded over the past two years. But, at an expected 3 to 3.5%, it likely will give the chemical industry an opportunity to continue its production and sales gains.

Average operating rates of Canadian chemical plants are up. The capacity utilization rate recorded by Statistics Canada jumped 4% last year and has been increasing steadily each quarter. Operating rates for industrial chemicals, which include the major petrochemicals, were up 7% last year. Other chemical industry segments with strong gains include paints and varnishes, plastics fabrication, rubber and plastics products, and pharmaceuticals.

There were—and still are—some weak spots. Production of the important fertilizer and pulp and paper chemicals grew very little, remained level, or were down last year. Output of sulfuric acid, for instance, was down 3.8% in 1985. Phosphoric acid, ammonium phosphate, and hydrochloric acid production also was off.

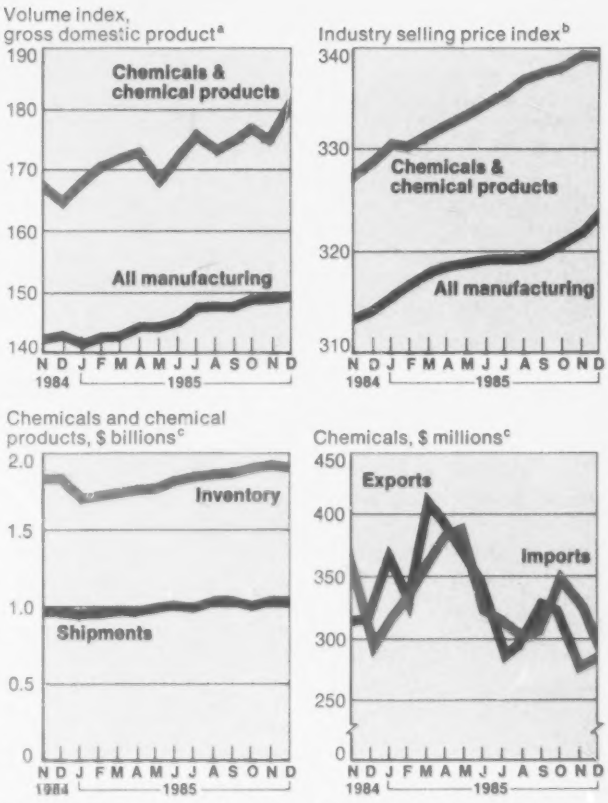
Canadian ammonia production increased 3.6% last year to 3.6 million metric tons. But, because of excess supplies and low prices, some companies with new ammonia projects in the works are taking a hard, second look at them. Five new ammonia plants are due on stream in Canada over the next two years. Two of the projects, however, already have been delayed.

On the other hand, output of ethylene and some of its key derivatives soared. Ethylene output rose 19%, and low-density polyethylene jumped a heady 39%. Polyvinyl chloride was another winner with an estimated 11% advance in production.

Higher exports, particularly to the U.S., can take a lot of the credit for the strong performance of plastics and resins. Despite the weaker U.S. dollar, the Canadian dollar remains weak by comparison. This makes Canadian exports very competitive in U.S. markets.

If the early-bird, first-quarter report of Celanese Canada is any indication, the Canadian chemical industry will like 1986. Company sales during the quarter increased 8.7%. Profits, however, skyrocketed 233%.

Earl Anderson, New York



a Seasonally adjusted, 1971 = 100. b 1971 = 100. c For 1984, $1.00 = $1.31 Canadian; for 1985, $1.00 = $1.36 Canadian. **Source:** Statistics Canada

Ethylene and derivatives lead the way

Production, thousands of metric tons	1983	1984	1985	% change 1984–85
ORGANICS				
Ethylene	1196	1464	1744	19.1%
Propylene	715	656	648	−1.3
Benzene	580	549	688	25.4
Toluene	411	395	473	19.5
Xylene	426	406	415	2.3
PLASTICS				
Polyethylene, low density	412	529	733	38.7
Polyethylene, high density	211	227	229	1.1
Polyvinyl chloride	243	252	280[b]	11.1[b]
INORGANICS				
Hydrochloric acid	170	161	158	−2.3
Nitric acid	1061	1100	1128	2.5
Phosphoric acid[a]	656	691	627	−9.2
Sulfuric acid	3686	4043	3890	−3.8
Ammonia, anhydrous	2888	3493	3620	3.6
Ammonium phosphate	1259	1383	1301	−5.9
Chlorine	1385	1424	1424	0.0
Sodium hydroxide	1528	1574	1589	0.9

a 100% P_2O_5. b C&EN estimate. **Source:** Statistics Canada